

## CLAIMS

1. A thermal compensating desmodromic valve actuation system for opening and closing at least one valve of an engine, said system comprising:

a cam assemblage, said cam assemblage including a cam mechanism for rotational movement;

a driving mechanism for reciprocal movement operably connected to said cam mechanism;

said driving mechanism also being operably connected to the at least one valve of the engine to move the at least one valve between a valve closed position and a valve open position and between said open position and said closed position in a manner directly related to said rotational movement of said cam mechanism;

means operably connected to said driving mechanism for adjustably controlling the movement of the at least one valve in order to provide a variable amount of opening of the at least one valve in said open position;

said adjustably controlling means further comprises an adjustable rotatable disk operably connected to said driving mechanism;

said adjustable rotatable disk having an elongated slot therein, said elongated slot having a predetermined length which effects a maximum amount of opening of the at least one valve, said elongated slot being disposed at an adjustable angle with respect to the center of the rotatable disk, said angle effecting the variable amount of said open position of the at least one valve; and

a valve stem thermal compensator disposed in said elongated slot, said valve stem thermal compensator having a pair of

distally opposed spring-like projections to maintain a pre-load therebetween,

whereby, the at least one valve being moved between said closed position and said open position and between said open position and said closed position without the intervention of any spring action.

2. The desmodromic valve actuation system as defined in claim 1 wherein:

said cam mechanism comprises a cam disk for said rotational movement about a shaft, said cam disk containing a preselectively configured grooved cam;

said driving mechanism comprises a drive link and a drive member, said drive link operably connected to said grooved cam;

said grooved cam having a first portion capable of displacing said drive link outwardly and inwardly such as to initiate a sequence of mechanical motions of said drive member to cause opening and closing of the at least one valve, and said grooved cam having a second portion that provides a dwell for said driving member so as to maintain the valve in said closed position for a predetermined period of time.

3. The desmodromic valve actuation system as defined in claim 1 wherein the at least one valve includes a valve stem; and

the valve actuation system further comprising means associated with said valve stem for connecting said valve stem to said elongated slot.

4. The desmodromic valve actuation system as defined in claim 3 wherein:

said connecting means comprises a drive pin operably connected with said elongated slot of said adjustable rotatable disk.

5. The desmodromic valve actuation system as defined in claim 4 wherein:

said elongated slot emanates from said rotatable disk center an appropriate length in accordance to said maximum amount of valve opening;

said elongated slot being disposed so as to create an angle with a line of action of said drive link, said angle referred to as an angle of attack;

said angle of attack effecting a linear displacement of said valve stem in a direction perpendicular to said line of action thereby resulting in opening of the at least one valve for the outward displacement of said driving mechanism via said drive link and closing of the at least one valve for the inward displacement of the driving mechanism via said drive link.

6. The desmodromic valve actuation system as defined in claim 5 wherein:

said angle of attack can vary from 0 degrees with no valve displacement and the at least one valve remaining in said closed position to a maximum angle of attack for maximum valve opening;

whereby said angle of attack with appropriate control can establish a substantially infinite variation in said angle of attack thereby providing substantially infinite variable valve openings.

7. The desmodromic valve actuation system as defined in claim 5 wherein:

the center of said rotatable disk is coincident with the line of action at all angles of attack as well as coincident with the centerline of said elongated slot such that if the at least one valve is to be maintained in said closed position the line of action of said drive link, the center of rotation of said

rotatable disk and the centerline of said elongated slot are all coincident.

8. The desmodromic valve actuation system as defined in claim 5 further comprising means operably connected to said rotatable disk to control the angle of attack of said elongated slot.

9. The desmodromic valve actuation system as defined in claim 1 further comprising means operably connected to said rotatable disk to control the angle of attack of said elongated slot.